

Data Capstone Project: Analyzing New York School District Data

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Our Research Process: An Overview

1. Brainstormed draft questions in the world of school funding
2. Narrowed our scope from worldwide to the district level in New York state
3. Data source collection to answer our questions
4. General exploratory data analysis
5. Solidification of our questions
6. ETL process
7. Visualization creation
8. Machine Learning

Our Data Sources

01

NYSED Website

The NYSED website was scraped for school district performance, demographics, and per-student expenditure on a district level

02

NYC Open Data and 2019 NY State District Data

Provided information on funding sources for NY school districts

03

U.S. Census Bureau

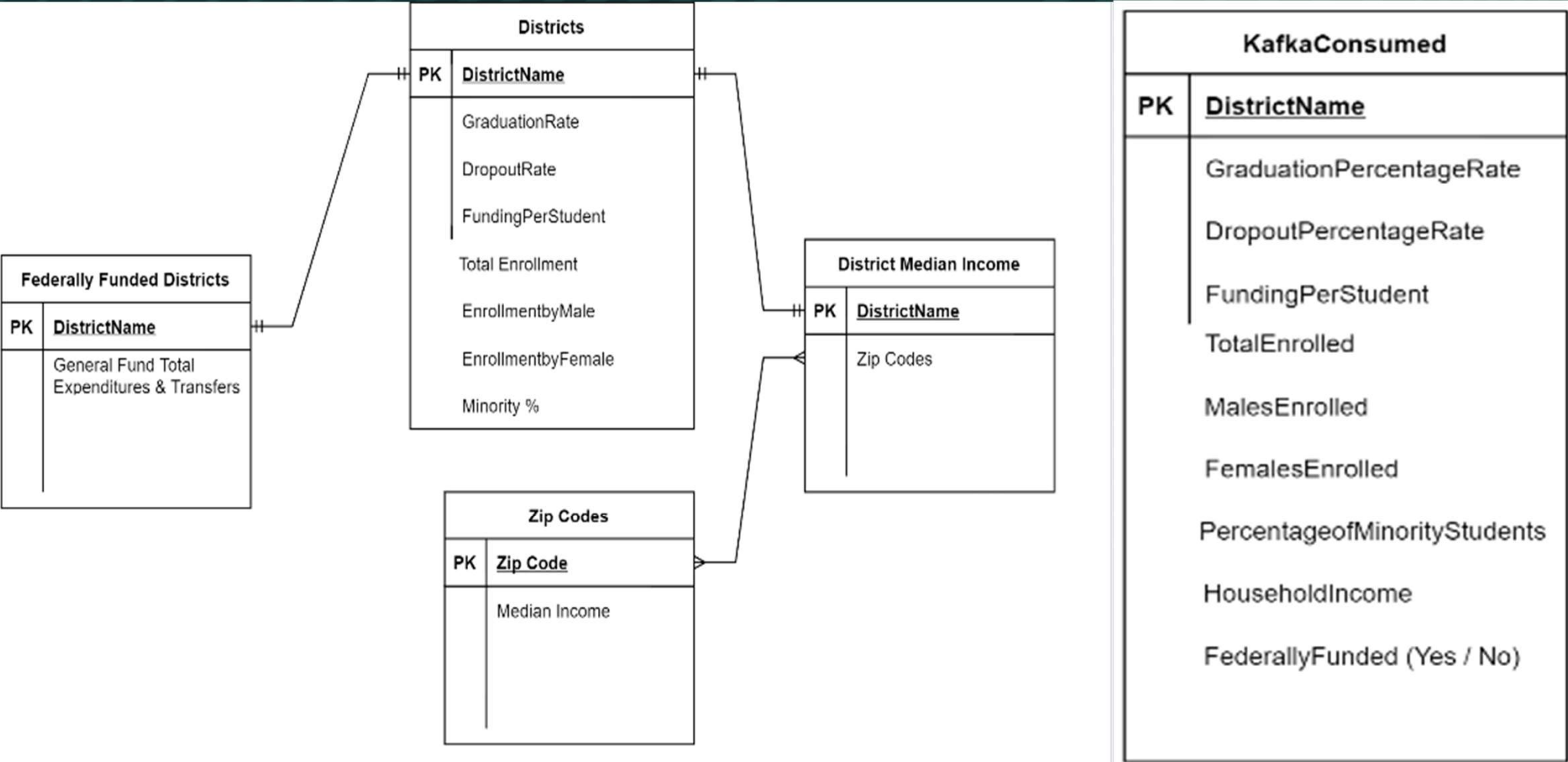
Provided median income by zip code which was used to find median income by district

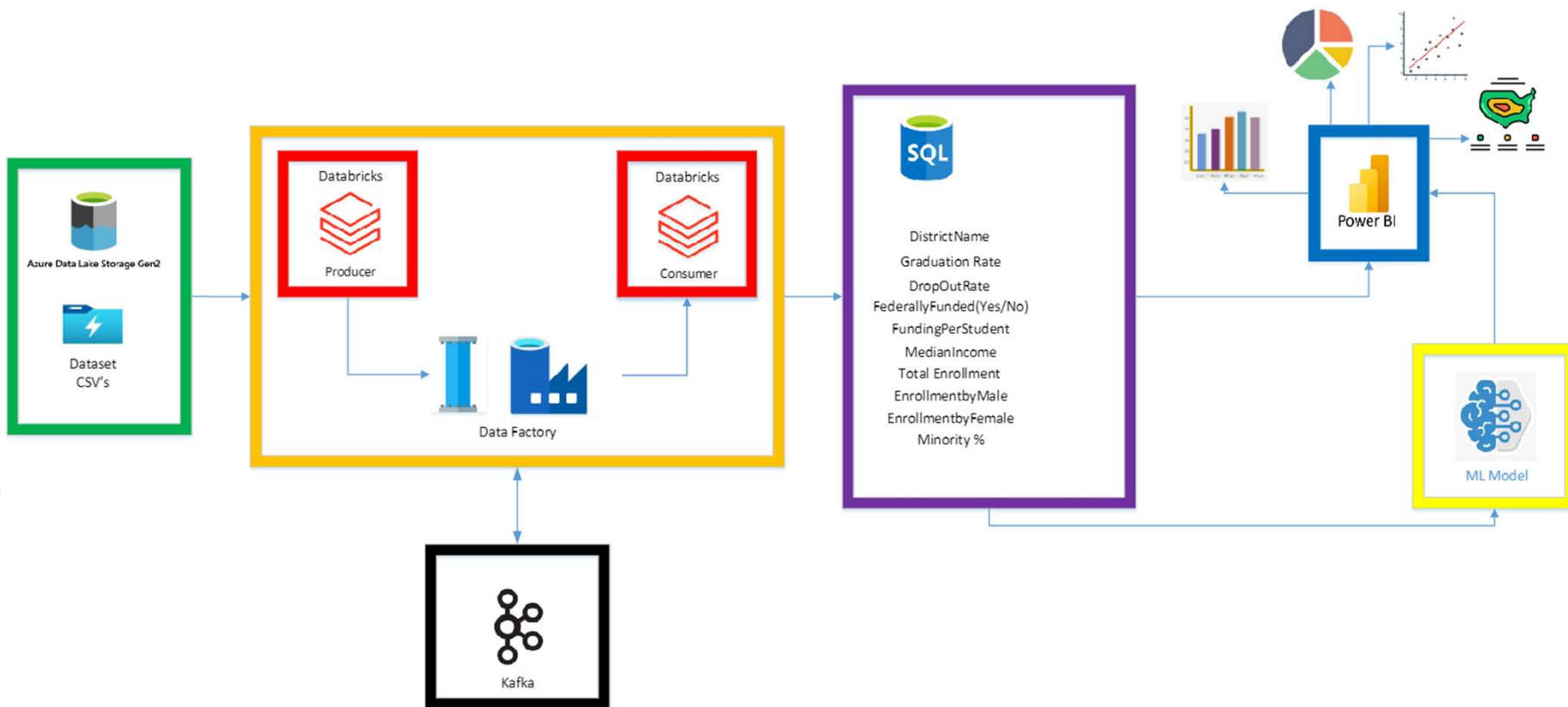
04

NCES School District Geographic Relationship Files

Used to map zip codes to school districts.

ER Diagrams





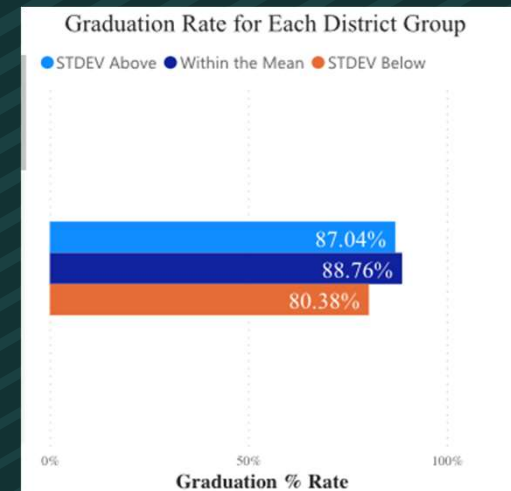
Which districts have the most funding per student and what differentiates them from the other districts? Is there a difference in graduation rate for these districts compared to the ones that don't receive as much funding?

Mean: \$23,251

Districts high in funding: > \$32,872

Remaining Districts: \$13,630 > x < \$32,872

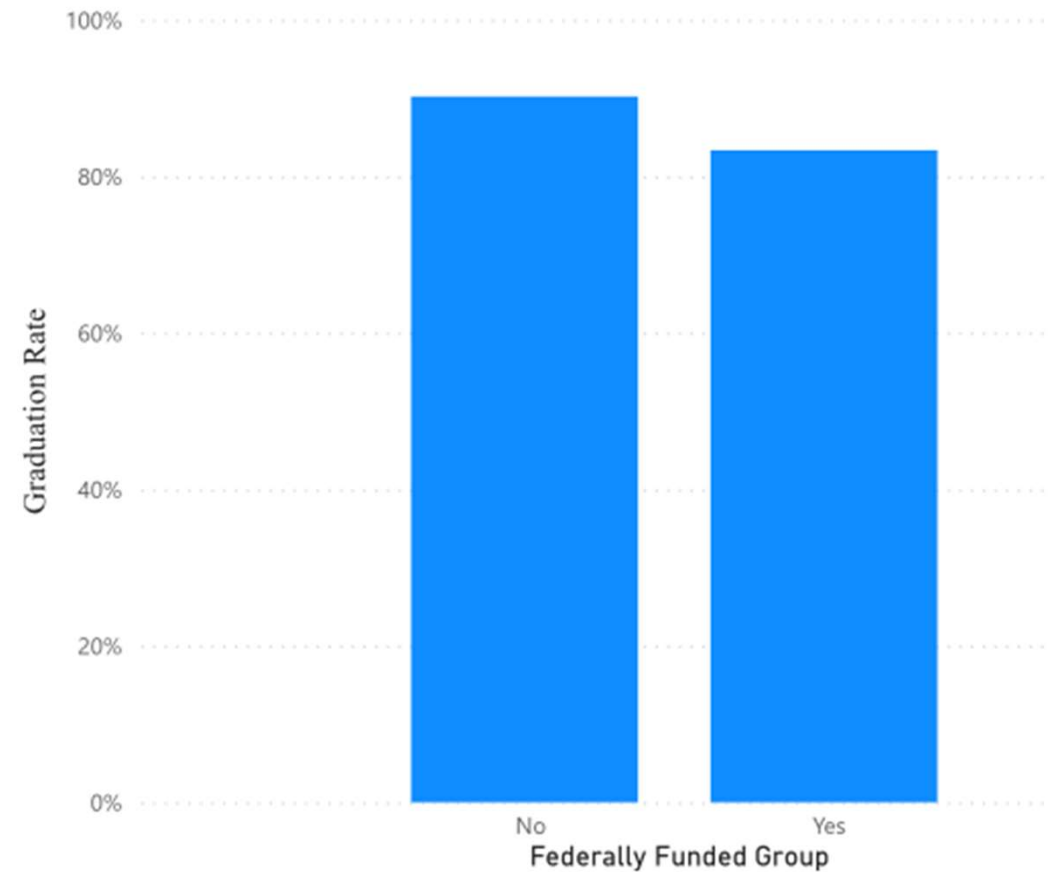
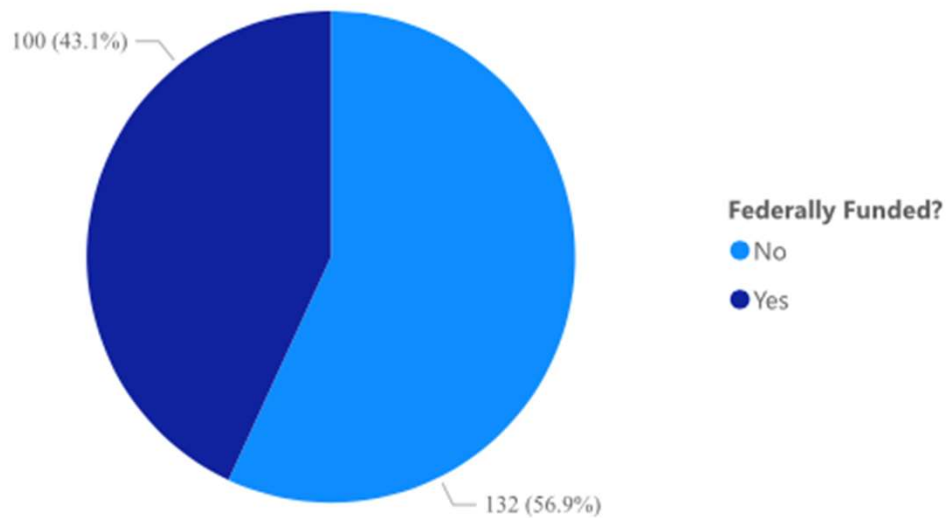
Districts low in funding: < \$13,630



	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	49.000000	49.000000	49.000000	49.000000	49.000000	49.000000	49.000000	47.000000
mean	87.571429	3.979592	48404.679184	1032.102041	541.387755	490.714286	32.085714	89658.304681

	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	14.000000	14.000000	14.000000	14.000000	14.000000	14.000000	14.000000	13.000000
mean	81.285714	6.142857	9386.046429	27535.928571	14570.928571	12965.000000	66.907143	68659.110000

What is the percentage of districts that get federal funding versus ones that do not? How do the districts that received federal funding compare to the ones that didn't?



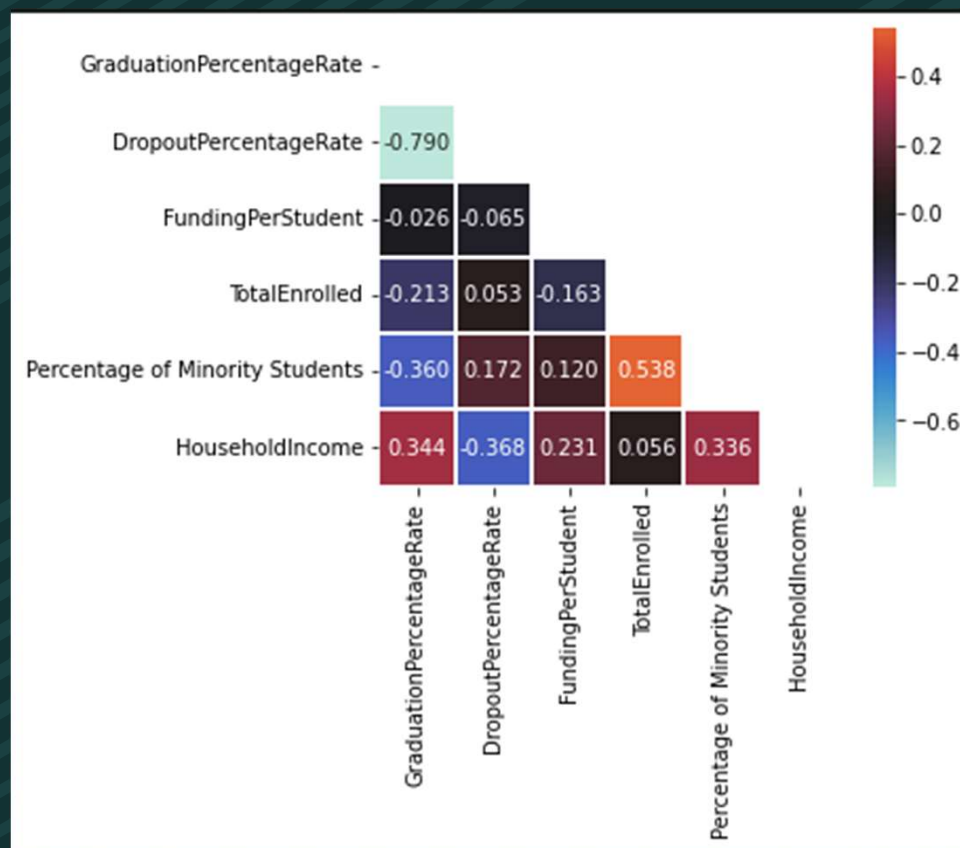
What is the percentage of districts that get federal funding versus ones that do not? How do the districts that received federal funding compare to the ones that didn't?

Federally funded districts -

	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	97.000000
mean	83.360000	6.360000	21122.053500	11889.160000	6140.020000	5749.140000	50.450000	68754.330515

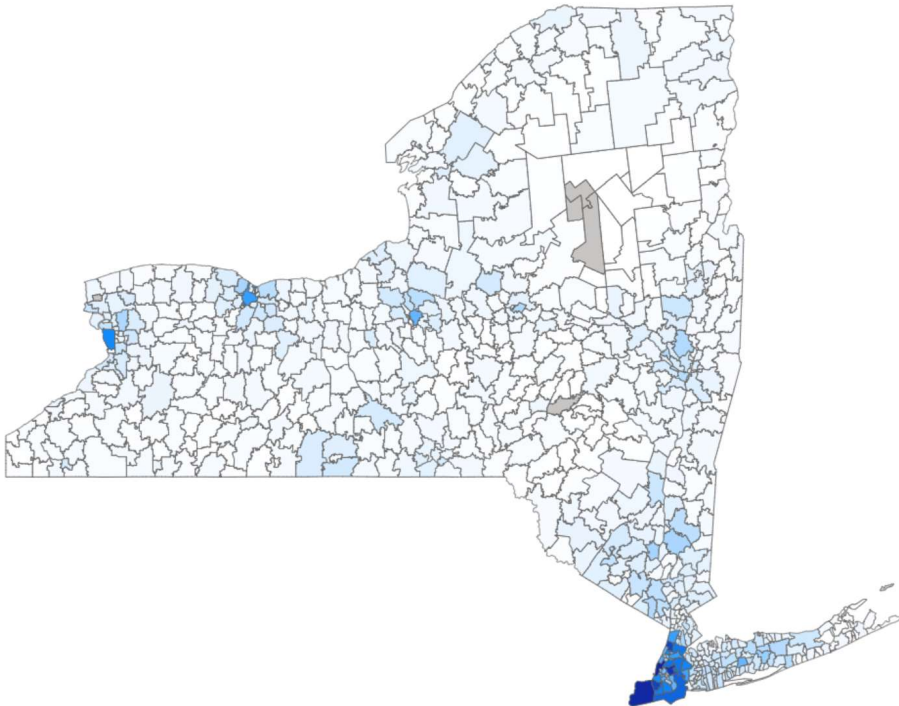
Non federally funded districts -

	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	132.000000	132.000000	132.000000	132.000000	132.000000	132.000000	132.000000	131.000000
mean	90.227273	3.765152	21962.976515	4104.393939	2103.121212	2001.272727	35.712121	95075.407481

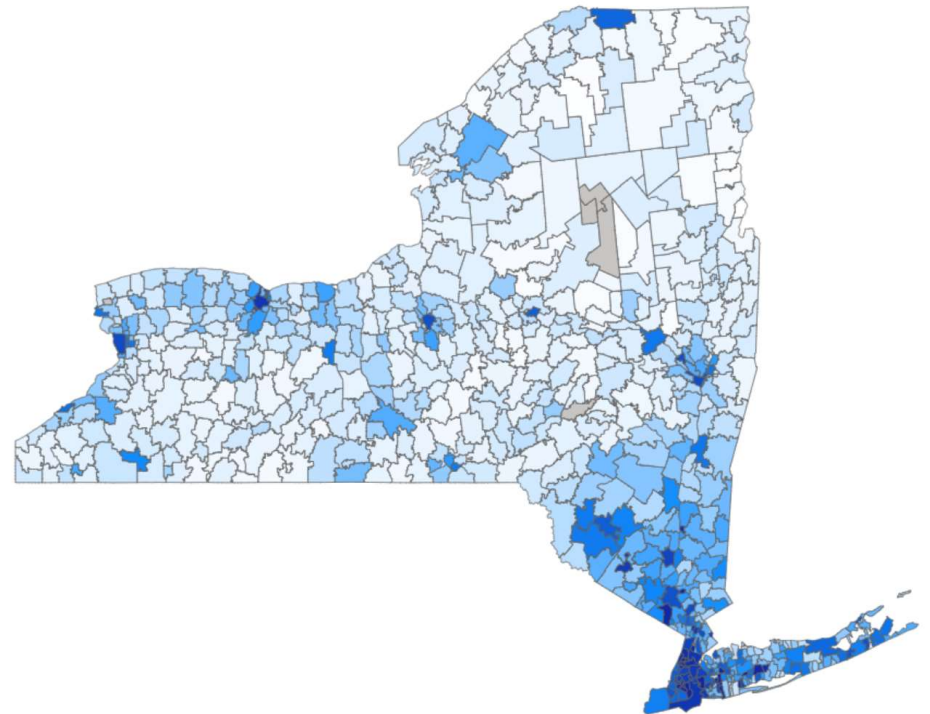


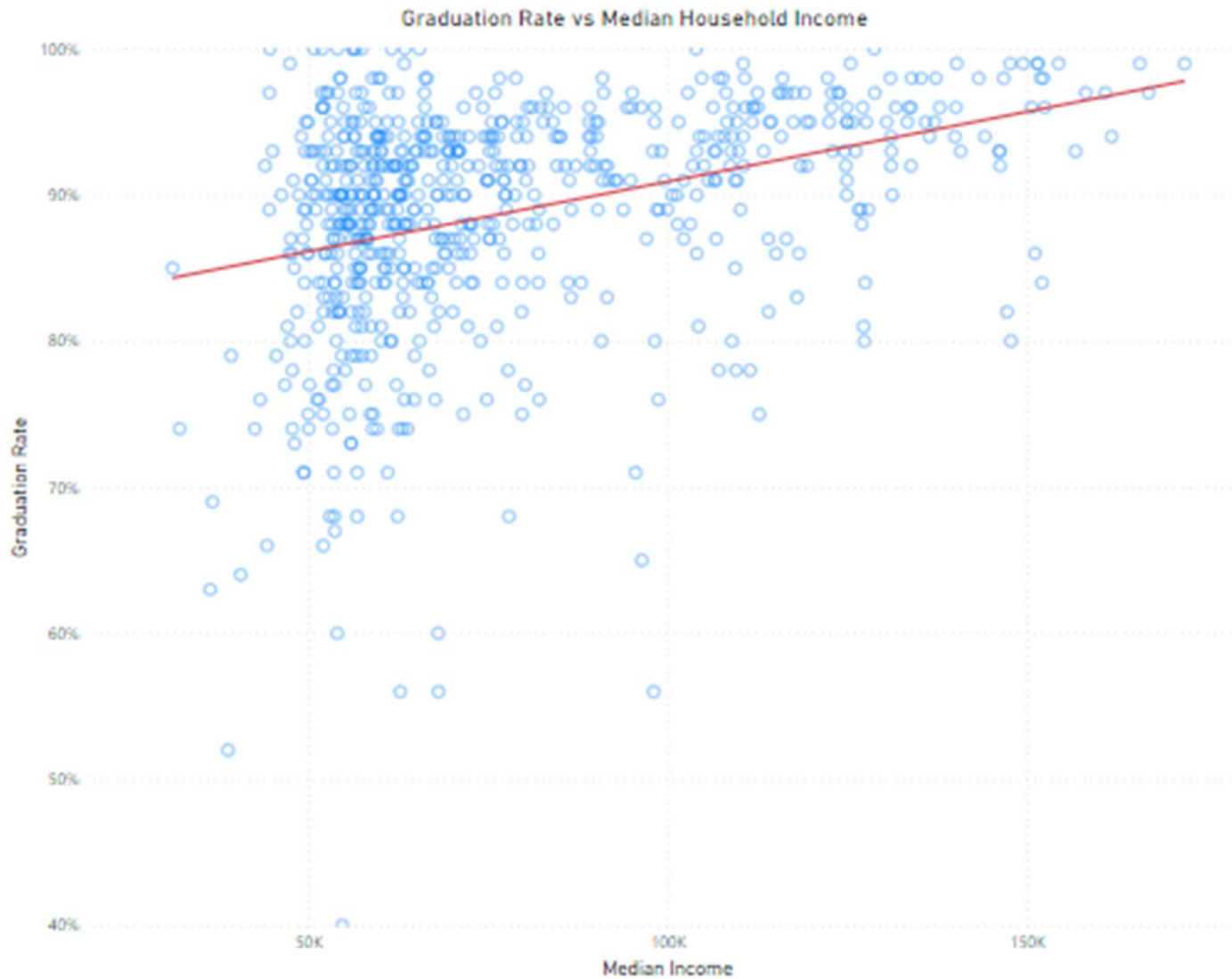
Correlation: 0.538

Total Enrollment by District



Percentage of Minority Students by District





Correlation: 0.344

Median Income Per District

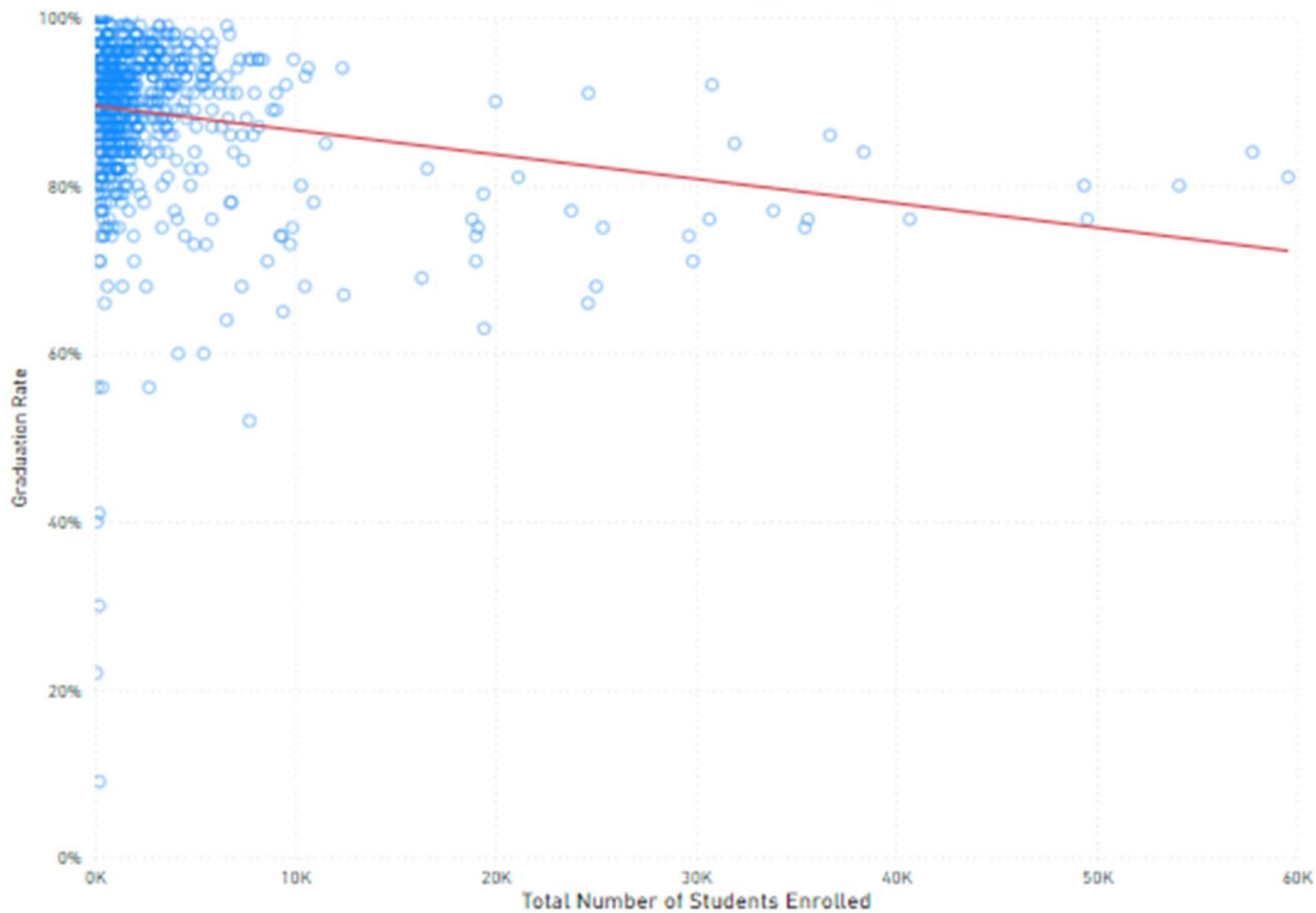
31,104.50

171,975.00



Is there a correlation between graduation rate and median income?

Students Enrolled and Graduation Percentage Rate by District Name



Total Enrolled

13.00

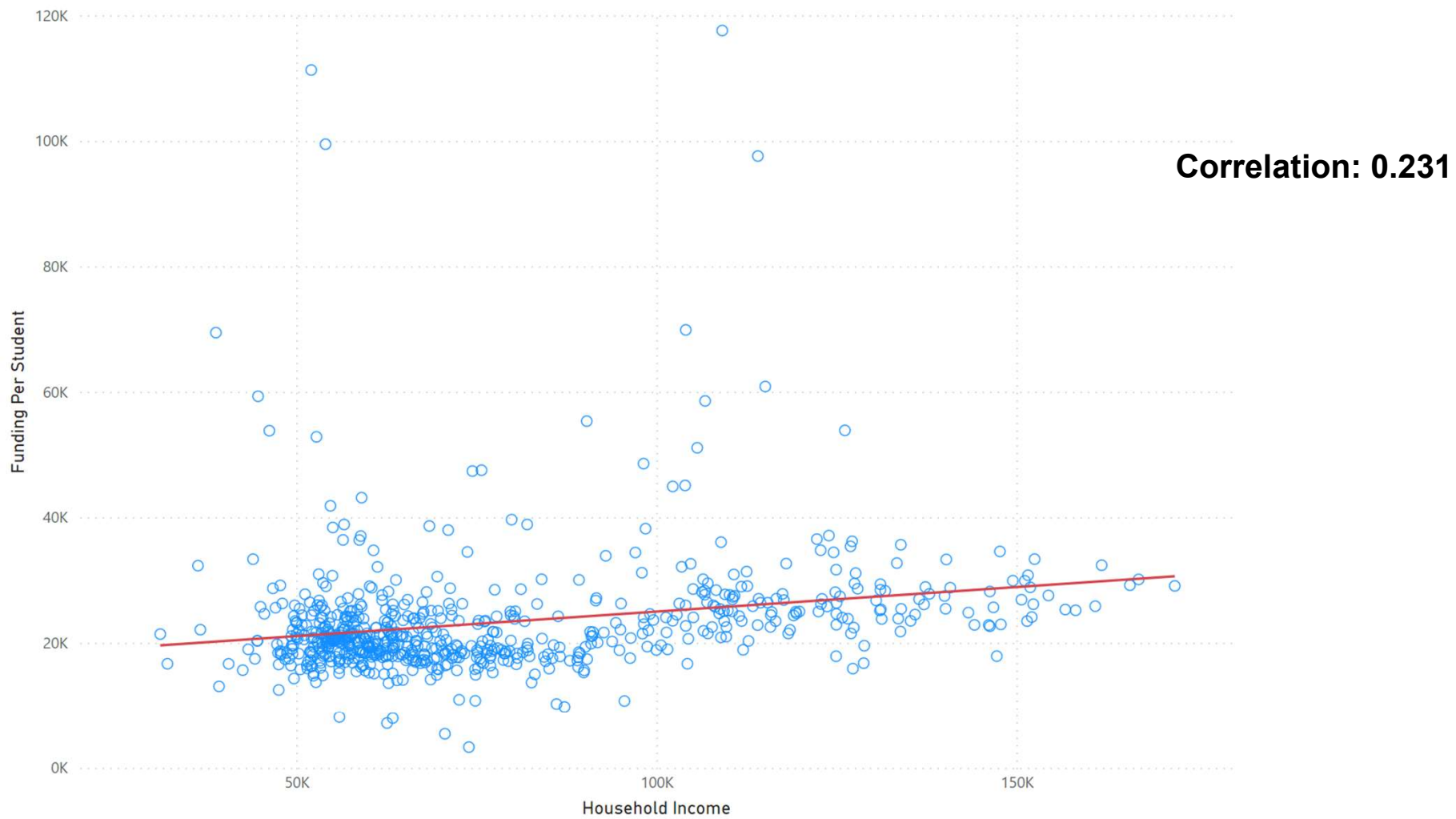
59,568.00

Correlation: -0.213

Is there a correlation between graduation rate and number of students enrolled?



Filters

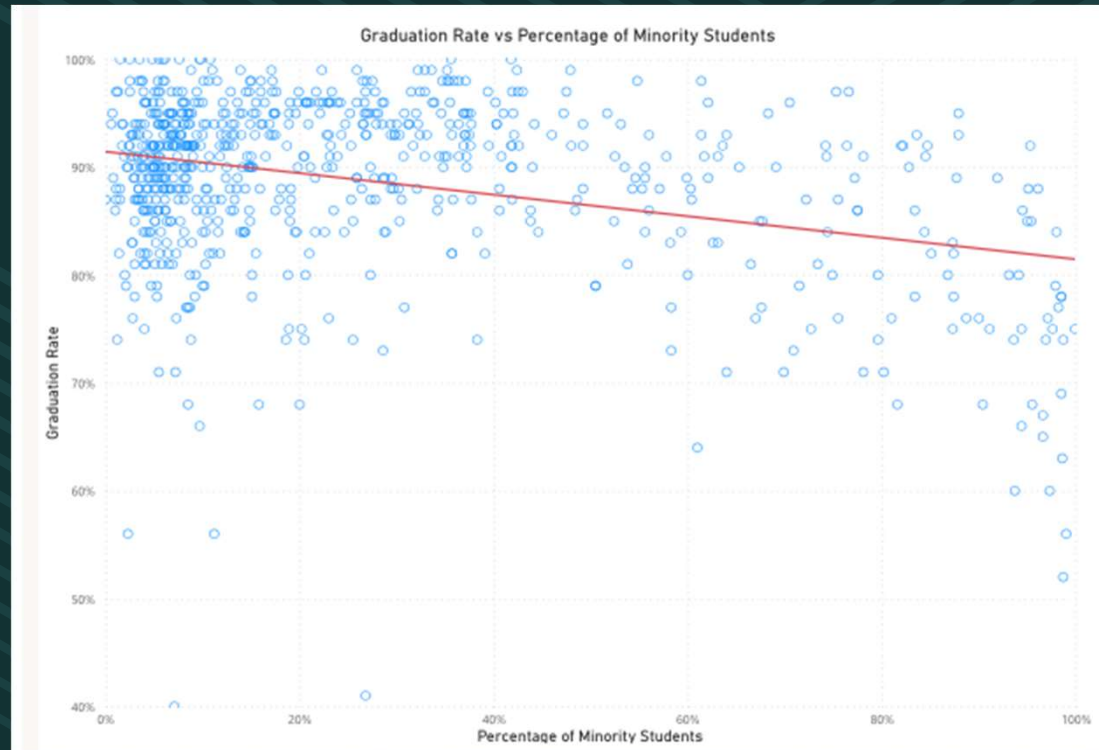


SchoolDistrictsVisualizations, Household Income vs Funding Per...

Data updated on 8/18/22 11:12 AM

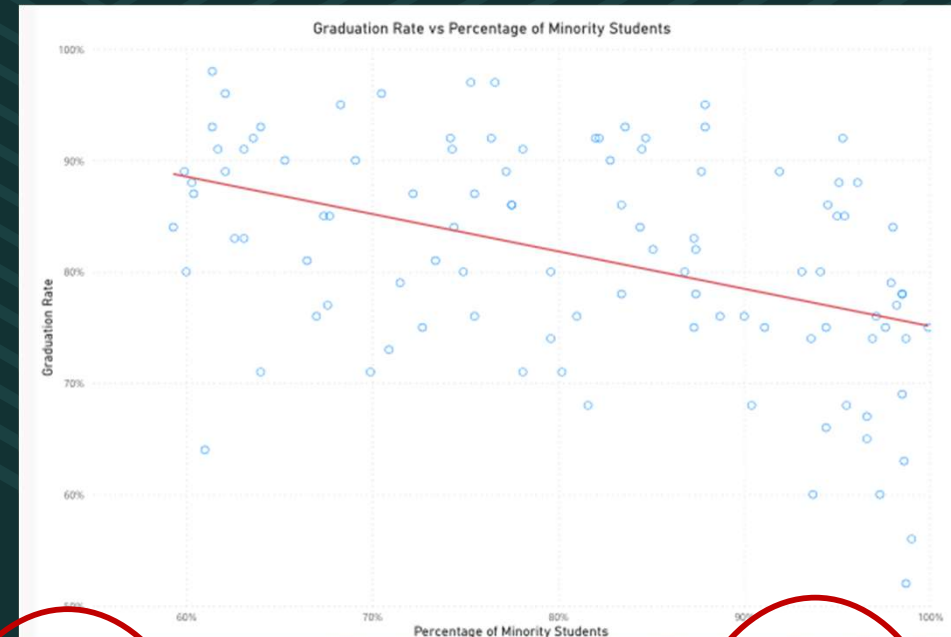
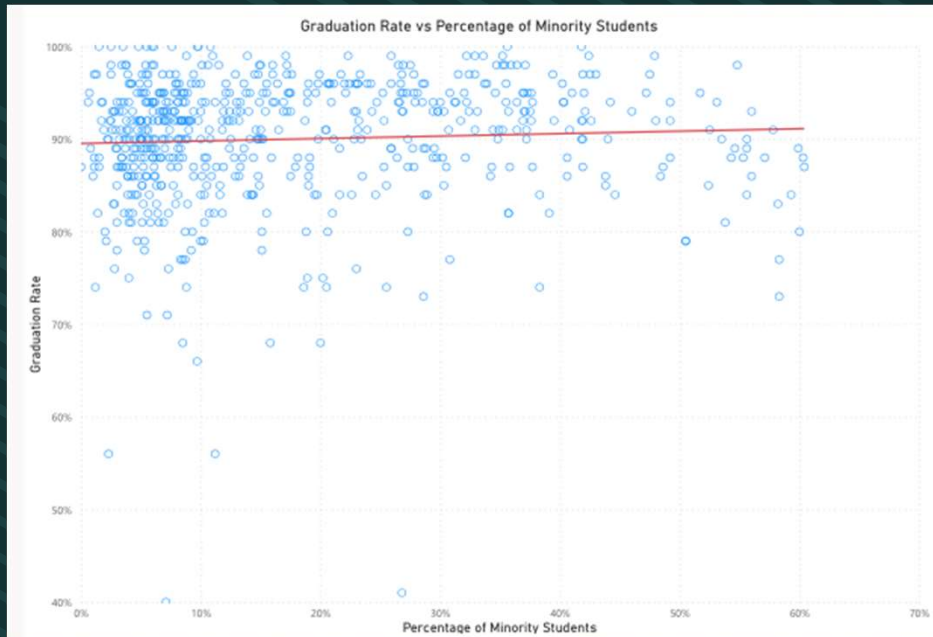


Is there a discrepancy between the graduation rate and the percentage of minority students in a district?



Correlation: -0.36

Is there a discrepancy between the graduation rate and the percentage of minority students in a district?

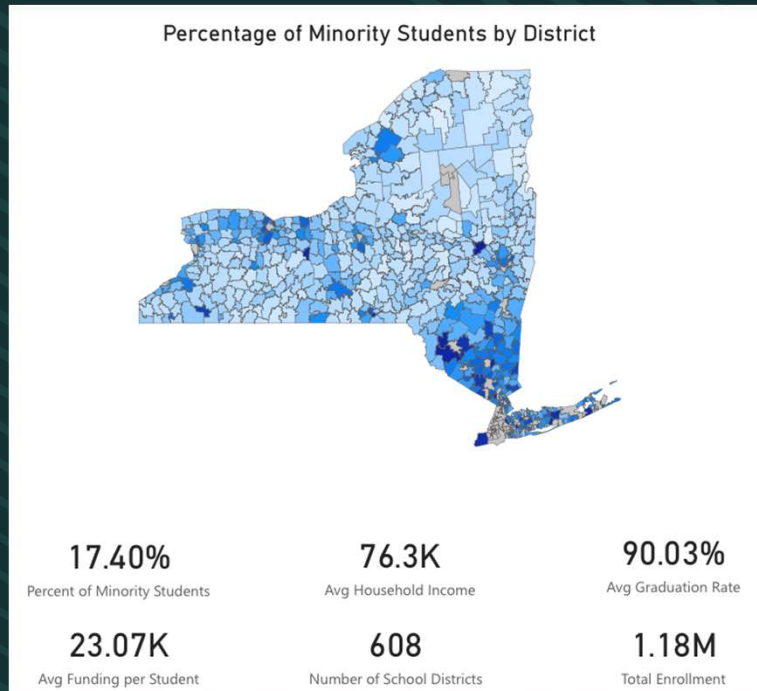


	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	609.000000	609.000000	609.000000	609.000000	609.000000	609.000000	609.000000	585.000000
mean	90.031199	4.338259	23066.290805	1954.374384	999.090312	955.284072	17.470115	76361.012427

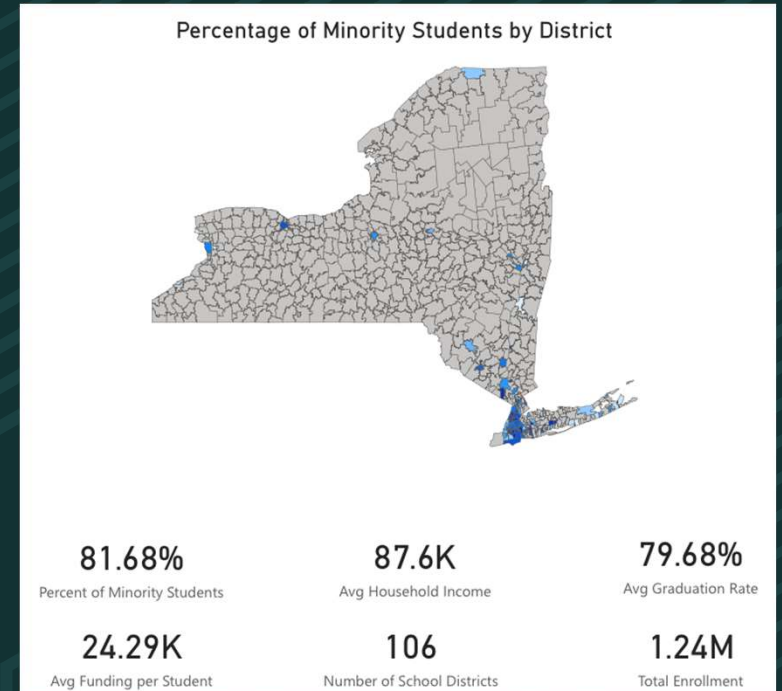
	GraduationPercentageRate	DropoutPercentageRate	FundingPerStudent	TotalEnrolled	MalesEnrolled	FemalesEnrolled	Minority	HouseholdIncome
count	104.000000	104.000000	104.000000	104.000000	104.000000	104.000000	104.000000	91.000000
mean	79.586538	7.307692	24327.020577	11815.932692	6110.000000	5705.932692	82.100000	87733.820769

Is there a discrepancy between the graduation rate and the percentage of minority students in a district?

< 60%



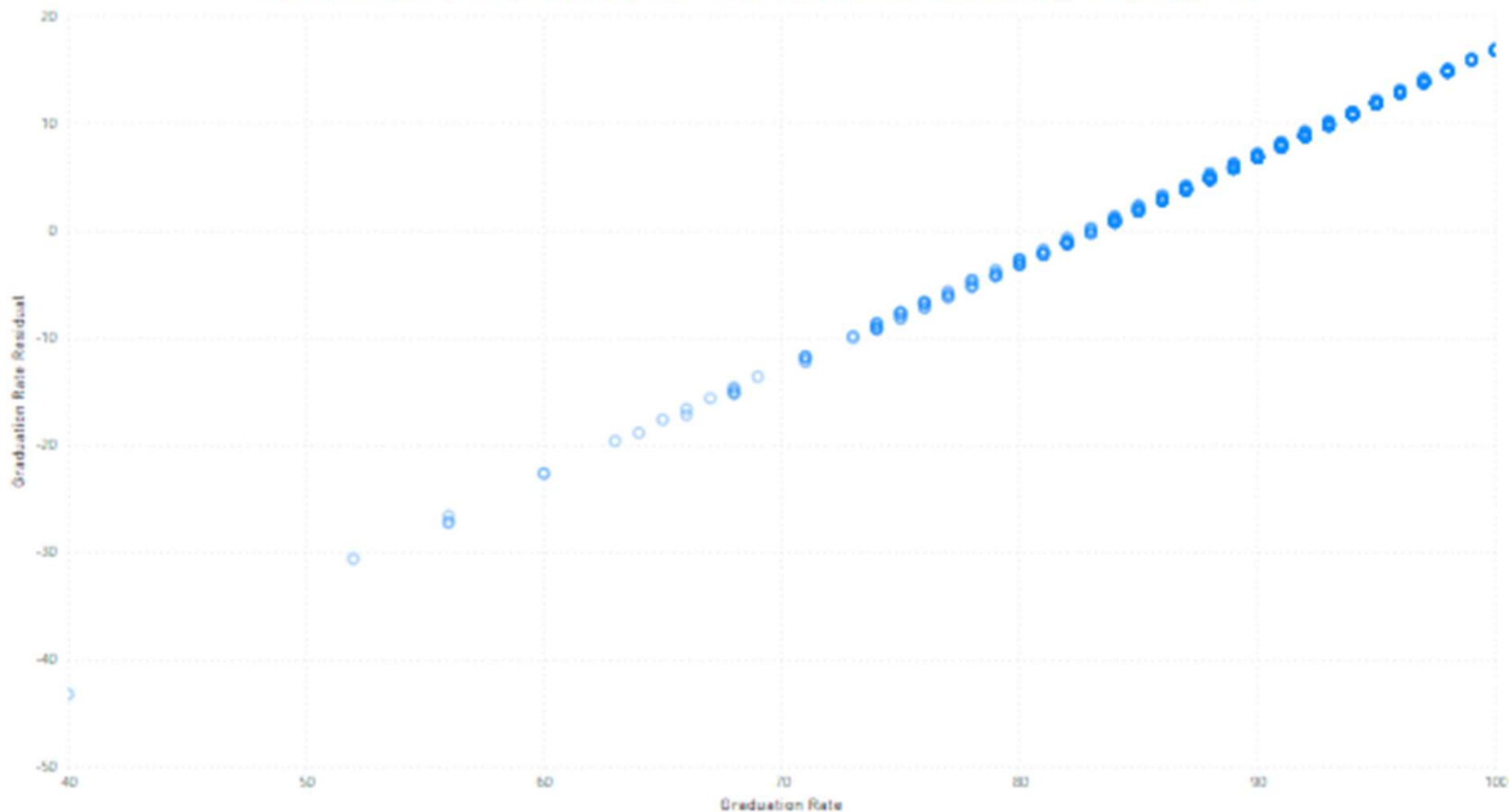
> 60%



Machine Learning

Can we predict the graduation rate for a district based on the data and which factor has the most effect on the graduation rate for a school district?

Graduation Rate vs. Graduation Rate Residuals for Lasso Regression Model



Filters >>

Search

There aren't any filters to display.



Highest Effect by Linear Coefficients

- Percentage of Minority Students: -0.0017
- Household Income: 0.00016
- Funding Per Student: -0.00011

Recommendations

- Distribute funds more evenly amongst school districts
- Districts without majority minority student bodies should consider ways of increasing diversity
- Research to discover the educational differences between rural and urban areas
- Further research into the differences between federally funded and non-federally funded districts
- Look at data from years before and after the 2019–2020 school year
 - To understand Covid-19 impacts, and see if there are any lasting trends

PowerBi Dashboard

https://app.powerbi.com/links/OxMVhG-D8y?ctid=d4e104e3-ae7d-4371-a239-745aa8960cc9&pbi_source=linkShare

THANKS

Do you have any
questions?

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RESOURCES

- Create Shape Map Visualizations in Power BI Desktop (preview)*. Use Shape maps in Power BI Desktop (Preview) - Power BI | Microsoft Docs. (2022). Retrieved from <https://docs.microsoft.com/en-us/power-bi/visuals/desktop-shape-map>
- Department of Health and Mental Hygiene (DOHMH). (2020, May 13). *Modified ZIP code tabulation areas (MODZCTA)*. Modified Zip Code Tabulation Areas (MODZCTA) | NYC Open Data. From <https://data.cityofnewyork.us/Health/Modified-Zip-Code-Tabulation-Areas-MODZCTA-/pri4-ifjk>
- NCES. (2022). *School District Geographic Relationship Files*. Geographic. Retrieved from <https://nces.ed.gov/programs/edge/Geographic/RelationshipFiles> "\GRF21\grf21_lea_zcta5ce20.xlsx"
- New York State. (2019). *2019 District Data – School Funding Transparency*. <https://openbudget.ny.gov/sft/sft-districts-19.html>
- New York State. (2022). *GIS.NY.GOV*. NYS GIS Clearinghouse - NYS Education Department - NYS Schools and School District Boundaries. From <https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1326>
- NYC Open Data. (2022). *School districts*. NYC Open Data. From <https://data.cityofnewyork.us/Education/School-Districts/r8nu-ymqi>
- NYC OpenData. (2021). *FY2020 Local Law 16 Final Report*. <https://data.cityofnewyork.us/Education/FY2020-Local-Law-16-Final-Report/cvqn-xqrr/data>
- NYSED. (2020). *Districts: NYSED Data Site*. data.nysed.gov. From <https://data.nysed.gov/lists.php?type=district>
- U.S. Census Bureau. (2020). *Income in the Past 12 Months (In 2020 Inflation-Adjusted Dollars)*. <https://data.census.gov/cedsci/table?q=median+income&g=860XX00US11701>
- Sielke, C. by C. C. (2001, March 19). *Public School Finance Programs of the U.S. and Canada: 1998-99*. National Center for Education Statistics (NCES) Home Page, a part of the U.S. Department of Education. Retrieved August 17, 2022, from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2001309>
- NYC Class Size 2020*. New York City Department of Education. (2020, February). Retrieved August 17, 2022, from <https://infohub.nyced.org/docs/default-source/default-document-library/2019-20-february-class-size-report---webdeck---accessible.pdf>